

CLAIMS

1. Printing device (11) for receipts (12), each having a first area (12a) bearing constant data (41a), i.e. unchanging from one receipt to the next, such as symbols and/or markings, suitable for identifying said receipts, and a second area (12b) bearing variable data (41b), i.e. subject to change from one receipt to the next, such as numerical data corresponding to the operations to be documented on each of said receipts, said device comprising:

a roll of paper (16) suitable for feeding, through a print path (21, 21a, 21c), a continuous paper ribbon (16a),

10 a first printing unit (22, 31), ink jet, dot-matrix type,

a second printing unit (23, 24) thermal, dot-matrix type, said first (22) and said second (23) printing unit being arranged along said print path (21),

15 feeding means (26, 29) for feeding said paper ribbon (16a) along said print path (21), whereby to permit printing of said paper ribbon by said first (22) and said second (23) printing unit, and

cutting means (17) for cutting said continuous paper ribbon (16a) after the printing, so as to form the receipts (12),

characterized in that said first ink jet printing unit (22) is provided for printing on said paper ribbon (16a) said constant data (41a), and said second thermal printing unit (23) is provided for printing on said paper ribbon said variable data (41b), for each (12) of said receipts.

2. Printing device (11) according to claim 1, wherein said roll of paper (16) consists of special thermal paper, that is to say heat-sensitive, to feed a corresponding ribbon (16a) of thermal paper through said print path (21), and said second printing unit (23) is suitable for carrying out printing by cooperating directly on contact and selectively heating dot-like areas of said thermal paper.

3. Printing device according to claim 1, wherein said roll of paper consists of plain paper for feeding a corresponding plain paper ribbon through said print path, and said second printing unit is suitable for carrying out printing by selectively heating dot-like areas of an ink ribbon, placed between said second printing unit and said plain paper ribbon, so as to transfer the ink from said ink ribbon to said plain paper ribbon.

4. Printing device according to claim 1 or 2 or 3, also comprising a control unit (25) suitable for managing the operation of said printing device (11), **characterized in** that said first ink jet printing unit (22) is suitable for printing said constant data (41a) for each of said receipts, automatically and independently of said variable data (41b), during a first preliminary printing step (51),

and in that said second thermal printing unit (23) is provided for printing, in response to a print command, said variable data (41b) received from said control unit (25) and relative to each of said receipts, during a second printing step (53) following said first printing step,

so that the time needed to complete the printing of each of said receipts, following the activation of said print command, is significantly shortened, not comprising the time to print said constant data already printed in advance.

5. Printing device according to claim 4, **characterized in** that said first ink jet printing unit (22) is provided for printing said constant data (41a) on said paper ribbon, in response to a print signal generated immediately after the cutting (54) of a receipt.

6. Device according to claim 4, wherein said second thermal printhead (23) is suitable for printing, during said second step (53) subsequent to said first step (51), a given length of said ribbon at a printing speed that is significantly greater than that of said first ink jet printhead (22), during said first step (51).

7. Printing device according to one of the previous claims, **characterized in** that said first ink jet printing unit (22) is colour type for printing on said paper ribbon (16a), in colour form, said predetermined symbols and/or characters.

5 8. Printing device according to one of the previous claims, **characterized in** said second thermal printing unit (23) is of the in-line type and comprises a printhead (24) arranged in a fixed position transversally with respect to said paper ribbon (16a) and also having a width substantially corresponding to that of the single line to be printed on said paper ribbon (16a).

10 9. Printing device according to any of the previous claims, **characterized in** that said first ink jet printing unit (22) is arranged downstream of said second thermal printing unit (23) along said print path (21) according to the direction of feeding of said paper ribbon (16a).

15 10. Printing device according to any of the previous claims, **characterized in** that it is associated with a further print path (21b, 21c) for single documents (19), such as cheques and bills, consisting of single separate sheets, wherein said further print path (21b, 21c) extends between an entrance zone (18), suitable for receiving said single documents (19), and an exit zone (20) for delivery to the outside of said single documents, after printing, wherein said further print path (21b, 21c) shares a common outlet stretch (21c) with the print path (21, 21a, 21c) provided for conveying said continuous paper ribbon (16a) coming from said roll of paper (16), and wherein said first ink jet printing unit (22) is arranged along said common stretch (21c).

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25 11. Method for the printing of receipts (12), each having a first area (12a) bearing constant data (41a), i.e. unchanging from one receipt to the next, such as symbols and/or markings, suitable for identifying said receipts, and a second area (12b) bearing variable data (41b), i.e. subject to change from one receipt

to the next, such as numerical data corresponding to the operations to be documented on each receipt, said method comprising the following steps:

- providing a printer (10) comprising:
 - a roll of paper (16) suitable for feeding a ribbon of continuous thermal paper (16a) through a print path (21),
 - 5 a first ink jet type printing unit (22, 31), - a second thermal type printing unit (23, 24), said first (22) and said second (23) printing unit being arranged along said print path (21),
 - 10 feeding means (26) for feeding said ribbon of thermal paper (16a) along said print path (21), so as to allow the printing of said ribbon of thermal paper by said first (22) and said second (23) printing unit, and
 - 15 cutting means (17) for cutting said ribbon of thermal paper (16a) after the printing, so as to form said receipts,
 - printing (51) on said ribbon of thermal paper (16a), via said first ink jet printing unit (22), said constant data (41a) for each of said receipts, automatically and independently of the relative variable data, during a first printing step (51),
 - printing (53) on said ribbon of thermal paper (16a), via said second thermal printing unit (23) and in response to a print command, the variable data (41b) relative to each of said receipts, during a second step (53) successive and temporally distinct from said first step (51), and
 - 20 cutting (54), with said cutting means (17), said ribbon of thermal paper, so as to detach and issue the receipt (12),
 - 25 whereby each receipt, following activation of said print command, is printed in a time faster than in the case where the constant data as well as the variable data had to be printed for the same receipt.

12. Method for the printing of receipts according to claim 11, wherein the speed of said second thermal printing unit (23), during said second printing step (53), is greater than that of said first ink jet printhead (22), during said first printing step (51), when printing a respective stretch of said ribbon (16a) of thermal paper having a given length.

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13. Method for the printing of receipts (12) according to claim 11, wherein said constant data (41a) is pre-stored in a control unit (25) of said printer, and the variable data (41b) is in each case received or keyed in through an input unit associated with said printer.